

REMARKS

Claims 1-14 are currently pending in the application. No claims have been amended or canceled. Applicant respectfully requests reconsideration of the application in view of the following remarks.

Claims 1-4 and 6-7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,923,766 to Oda ("Oda"). Independent claims 1 relates to a device for increasing a perceived bandwidth in an audio signal path with limited bandwidth. Applicant respectfully submits that Oda fail to teach, suggest, or anticipate at least one of the distinguishing features of independent claim 1, namely, wherein a means for producing harmonics comprises a harmonic generator for producing out-of-band harmonics.

Oda describes a low frequency audio conversion circuit for converting an input audio signal that includes a low frequency audio component lower than a frequency a speaker can reproduce to a frequency that falls within the frequency range of the speaker. Fig. 1 of Oda illustrates that input audio signal is low pass filtered by a first low pass filter 1 that passes only low frequency audio signals having a frequency lower than the lowest reproduction limit of the speaker. The output of the low pass filter is passed to a full wave rectifier 2 that generates even-numbered harmonics of the signal. A second low pass filter 3 passes only the secondary harmonics among the even-numbered harmonics generated by the full wave rectifier 2. An amplifier 4 amplifies the secondary harmonics supplied from the low pass filter 3, and an adder 5 adds the amplified secondary harmonics signal to the input audio signal. Oda asserts that a better effect is produced by reproducing a sound with a low frequency component below the lowest limit a speaker can reproduce as secondary harmonics, rather than eliminating the low frequency component.

Applicant respectfully submits that Oda fails to disclose a harmonic generator for producing out-of-band harmonics as claimed. In contrast to independent claim 1, Oda describes producing harmonics of audio that are at too low of a frequency to be reproduced by a speaker to convert the audio to a frequency range that can be reproduced by the speaker. Applicant respectfully submits that independent claim 1 distinguishes over Oda and respectfully requests that the rejection thereof be withdrawn.

Dependent claims 2-4 and 6-7 depend from and further restrict independent claim 1 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 1, dependent claims 2-4 and 6-7 also distinguish over Oda. Withdrawal of the rejection of dependent claims 2-4 and 6-7 is respectfully requested.

In addition, Applicant respectfully submits that Oda fail to teach, suggest, or anticipate at least one of the distinguishing features of dependent claim 3, namely, wherein the filter is arranged to separate an upper portion of a pass band as an input to the harmonic generator. According to Oda, the first low-pass filter 1 as described in column 4, lines 50-53 discloses receiving input audio signals and passing only low frequency audio signals to a full wave rectifier 2. Oda contains no teaching or suggestion that the low pass filter 1 is arranged to separate an upper portion of a pass band as an input to the harmonic generator as claimed. For this additional reason, Applicant respectfully submits that dependent claim 3 distinguishes over Oda and respectfully requests that the rejection thereof be withdrawn.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Oda as applied to claim 2 and further in view of U.S. Patent No. 6,865,430 to Runton et al. ("Runton"). Runton discloses a digital signal processor that includes a harmonic enhancer to provide a harmonically enhanced audio signal. Applicant respectfully submits that Runton fails to cure the deficiencies of Oda noted above with respect to claim 1.

Dependent claim 5 depends from and further restricts independent claim 1 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 1, dependent claim 5 distinguishes over the combination of Oda and Runton. Withdrawal of the rejection of dependent claim 5 is respectfully requested.

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Oda as applied to claim 1 and further in view of U.S. Patent No. 6,606,388 to Townsend et al. ("Townsend"). Townsend discloses a method and system for enhancing audio signals generated from compressed digital audio files that uses a bass maximizer module, a harmonic exciter module, and a quasi stereo module. Applicant respectfully submits that Townsend fails to cure the deficiencies of Oda noted above with respect to claim 1.

Dependent claim 11 depends from and further restricts independent claim 1 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 1, dependent claim 11 distinguishes over the combination of Oda and Townsend. Withdrawal of the rejection of dependent claim 11 is respectfully requested.

Claims 8-10 and 13-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oda as applied to claim 1 in view of U.S. Patent No. 6,023,513 to Case ("Case") and further in further view of U.S. Published Patent Application No. 2001/0034252 to Mousty et al. ("Mousty"). Case discloses a system for improving clarity of low bandwidth audio systems including a path having a high pass filter and a block for generating even harmonic distortion for those frequencies selected by the high pass filter. Mousty discloses an acoustic signal generation device including an arithmetic unit used to generate an output signal having a fundamental frequency enriched with harmonics of different frequencies. Applicant respectfully submits that the combination of Case and Mousty fails to cure the deficiencies of Oda noted above with respect to claim 1.

Dependent claims 8-10 and 13-14 depend from and further restrict independent claim 1 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 1, dependent claims 8-10 and 13-14 distinguish over the combination of Oda, Case, and Mousty. Withdrawal of the rejection of dependent claims 8-10 and 13-14 is respectfully requested.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Oda as applied to claim 1 in view of Mousty. Mousty discloses an acoustic signal generation device including an arithmetic unit used to generate an output signal having a fundamental frequency enriched with harmonics of different frequencies. Applicant respectfully submits that Mousty fails to cure the deficiencies of Oda noted above with respect to claim 1.

Dependent claim 12 depends from and further restricts independent claim 1 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 1, dependent claim 12 distinguishes over the

combination of Oda and Mousty. Withdrawal of the rejection of dependent claim 12 is respectfully requested.

In view of the above remarks, Applicant respectfully submits that the present application is in condition for allowance. A Notice to that effect is respectfully requested.

Dated: February 15, 2007

Respectfully submitted,

By 

Shoaib A. Mithani

Registration No.: L0067

JENKENS & GILCHRIST, A PROFESSIONAL
CORPORATION

1445 Ross Avenue, Suite 3700

Dallas, Texas 75202

(214) 855-4500

Attorneys For Applicant